

REMARKS

The above amendment has been made merely to correct printing errors in the subject application. No new material has been added by way of this amendment.

If the Examiner wishes to discuss the Preliminary Amendment, the Examiner is encouraged to contact Stephen E. Arnett by telephone (206) 583-8888.

Respectfully submitted,

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Appendix (Marked-up specification)

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## Appendix – Specification Marked to Show Changes

$$\text{EQN (4)} \quad \cancel{x} \approx \cancel{1} - \frac{1}{2z^2} \frac{\cancel{\phi}}{\cancel{\phi}} \frac{1}{\cancel{\phi} z \sqrt{2p}} e^{-z^2/2} \quad \underline{\xi \cong \left(1 - \frac{1}{2z^2}\right) \left(\frac{1}{z\sqrt{2\pi}} e^{-z^2/2}\right)}$$

A Z score can also be derived using Newton's iterations and equation 4 as follows:

Define  $P = \phi(z)$ , and then from equation 4:

$$\begin{aligned} \cancel{f(z)} &\approx \cancel{1} - \frac{1}{2z^2} \frac{\cancel{\phi}}{\cancel{\phi}} \frac{1}{\cancel{\phi} z \sqrt{2p}} e^{-z^2/2} & \phi(z) &\cong 1 - \left(1 - \frac{1}{2z^2}\right) \frac{1}{z\sqrt{2\pi}} e^{-z^2/2} \\ \cancel{\text{let } G(z) = f(z) - p} & & \underline{\text{let } G(z) = \phi(z) - p} \end{aligned}$$

Substituting the expression of  $\phi(z)$  into  $G(z)$  results in equation 5:

$$\begin{aligned} \text{EQN (5)} \quad \cancel{G(z)} &= \cancel{1} - \cancel{p} - \frac{1}{2z^2} \frac{\cancel{\phi}}{\cancel{\phi}} \frac{1}{\cancel{\phi} z \sqrt{2p}} e^{-z^2/2} & G(z) &= 1 - p - \left(1 - \frac{1}{2z^2}\right) \frac{1}{z\sqrt{2\pi}} e^{-z^2/2} \\ &= \cancel{x} - \frac{1}{2z^2} \frac{\cancel{\phi}}{\cancel{\phi}} \frac{1}{\cancel{\phi} z \sqrt{2p}} e^{-z^2/2} & &= \underline{\xi - \left(1 - \frac{1}{2z^2}\right) \frac{1}{z\sqrt{2\pi}} e^{-z^2/2}} \end{aligned}$$

Taking the first derivative of  $G(z)$  with respect to  $z$  results in:

$$\frac{dG(z)}{dz} = \frac{df(z)}{dz} = \cancel{f'(z)} \quad \underline{\frac{dG(z)}{dz} = \frac{d\phi(z)}{dz} = \phi'(z)}$$

Hence, the iteration formula is given by equation 6:

$$\text{EQN (6)} \quad \frac{Z_{n+1} = Z_n - \frac{G(Z_n)}{f'(Z_n)}}{\quad} \quad \underline{Z_{n+1} = Z_n - \frac{G(Z_n)}{\phi'(Z_n)}} \quad n=0, 1, 2, 3, 4, \dots$$